

CLAIMS

1. A magnetic memory cell comprising an annular magnetic layer through which extends at least one
5 conductor that generates a magnetic field, and a laminate configured so as to include: a first magneto-sensitive layer, a magnetization direction of which is changed by the magnetic field in the annular magnetic layer; and a magnetoresistive effect revealing body
10 disposed on a surface of the first magneto-sensitive layer so that an electric current flows in a direction perpendicular to a laminating surface of the laminate,
wherein the first magneto-sensitive layer has a thickness set in a range of not less than 0.5 nm to not
15 more than 40 nm.

2. A magnetic memory cell comprising a plurality of storage elements each having an annular magnetic layer through which extends at least one conductor that
20 generates a magnetic field, and a laminate configured so as to include: a first magneto-sensitive layer, a magnetization direction of which is changed by the magnetic field in the annular magnetic layer; and a magnetoresistive effect revealing body disposed on a
25 surface of the first magneto-sensitive layer so that an electric current flows in a direction perpendicular to a laminating surface of the laminate,

wherein the plurality of annular magnetic layers are configured so as to be arranged side by side such
30 that directions of respective axes coincide with each other, and so as to share a predetermined portion of each with each other;

wherein the plurality of first magneto-sensitive layers are disposed on a same side with respect to a
35 plane including the axes, and each have a thickness set in a range of not less than 0.5 nm to not more than 40

nm.

3. A magnetic memory cell according to claim 2,
wherein the plurality of first magneto-sensitive layers
5 are magnetized in respective directions antiparallel to
each other by the magnetic fields.

4. A magnetic memory cell according to any of
Claims 1 to 3, wherein each first magneto-sensitive
10 layer has a thickness set in a range of not less than
0.5 nm to not more than 30 nm.

5. A magnetic memory cell according to any of
Claims 1 to 4, wherein a plurality of the conductors
15 extend through the plurality of annular magnetic layers,
and the plurality of the conductors extend in parallel
to each other in a region where the plurality of the
conductors extend through the plurality of annular
magnetic layers.

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6. A magnetic memory cell according to any of
Claims 1 to 5, wherein the laminate comprises a second
magneto-sensitive layer which can be magnetically
exchange-coupled with each first magneto-sensitive
25 layer.

7. A magnetic memory cell according to Claim 6,
wherein the laminate comprises a non-magnetic layer, a
first magnetic layer with a fixed magnetization
30 direction deposited on one surface side of the non-
magnetic layer, and a second magnetic layer deposited
on the other surface side of the non-magnetic layer and
functioning as the second magneto-sensitive layer,
wherein information can be detected based on the
35 electric current flowing through the laminate.

8. A magnetic memory cell according to Claim 7,
wherein the first magnetic layer is formed using a
material having a larger coercive force than the second
magnetic layer.

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9. A magnetic memory device including a magnetic
memory cell according to any of Claims 1 to 8,

write lines as the plurality of the conductors,
and

10 read lines that supply the electric current to
the laminate.